SAFETY DATA SHEET

Product: POLYESTER RESIN

1- IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND COMPANY/ UNDERTAKING

Product name:	POLYESTER RESIN
Company:	ELEKEIROZ S.A.
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2- HAZARDS IDENTIFICATION

Most important hazards:	Flammable liquid and vapour. May be harmful if swallowed. May be harmful if inhalated. Causes skin irritation. Causes eye irritation. Suspected of causing genetic defects. Suspected of causing cancer. Suspected of damaging fertility or the unborn child. May cause respiratory irritation and damage to the central and peripheral nervous system and respiratory tract through prolonged or repeated exposure. Toxic to aquatic life.
Product effects	
Adverse effects to the human health:	It can cause central and peripheral nervous system effects, can cause chemical pneumonitis if inhaled and gastrointestinal disturbances.
Environmental effects:	Dangerous to aquatic life.
Physical and chemical hazards:	Flammable product. Containers may explode when heated. When heated, may release toxic and irritating fumes.
According to Regulation 1272:2008 (GHS):	
Classification of the substance or mixture:	Flammable liquids – Category 3 Skin corrosion/ irritation – Category 2 Serious eye damage/ eye irritation – Category 2 Germ cell mutagenicity – Category 2

	Carcinogenicity – Category 2 Toxic to reproduction – Category 1B Specific target organ toxicity following single exposure–Category 1 and 3 Specific target organ toxicity following repeated exposure – Category 1 Aspiration hazard – Category 1
Label elements according to Regulation 1272:2008 (GHS):	
Symbol:	
Signal word:	DANGER
Hazard Statement:	H226 - Flammable liquid vapour. H315 - Causes skin irritation. H319 - Causes serious eye irritation. H341 - Suspected of causing genetic defects. H351 - Suspected of causing cancer. H361 - Suspected of damaging fertility or the unborn child. H370 - Causes damage to the central and peripheral nervous system. H335 - May cause respiratory irritation. H336 - May cause drowsiness or dizziness. H373 - May cause damage to the central and peripheral nervous system and respiratory tract through prolonged or repeated exposure. H304 - May be fatal if swallowed and enters airways.
Precaution Statement:	P210 - Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P233 - Keep container tightly closed. P240 - Ground/bond container and receiving equipment P241 - Use explosion-proof electrical/ventilating/lighting/equipment P242 - Use only non-sparking tools. P243 - Take precautionary measures against static discharge P280 - Wear protective gloves/protective clothing/eye protection/face protection. P264 - wash with water thoroughly after handling P201 - Obtain special instructions before use

	P202 - Do not handle until all safety precautions have been read and understood. P260 - Do not breathe dust/fume/gas/mist/vapours/spray. P270 - Do not eat, drink or smoke when using this product. P261 - Avoid breathing dust/fume/gas/mist/vapours/spray. P271 - Use only outdoors or in a well-ventilated area.
Label elements according to Directive 67/548/EEC	
Symbol:	Xi, Xn, T, T^+
Risk Phrases	R10 – Flammable. R38 – Irritating to skin R36 - Irritating to eyes R68 - Possible risk of irreversible effects. R40 – Limited evidence of a carcinogenic effect. R60 & T R61 – May impair fertility. May cause harm to the unborn child T+, R39 – Danger of very serious irreversible effects. R37, R67 – Irritating to respiratory system. Vapors may cause drowsiness and dizziness. R48 – Danger of serious damage to health by prolonged exposure. R65 - Harmful: may cause lung damage if swallowed.
Safety Phrases:	S16 - Keep away from sources of ignition - No smoking. S3 - Keep in a cool place. S9 - Keep container in a well-ventilated place. S13 - Keep away from food, drink and animal feedingstuffs S24 - Avoid contact with skin. S25 - Avoid contact with eyes. S36 - Wear suitable protective clothing. S37 - Wear suitable gloves S29 - Do not empty into drains. S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S56 - Dispose of this material and its container to hazardous or special waste collection point.

3- COMPOSITION/INFORMATION ON INGREDIENTS

Substance:	
Chemical name:	Polyester resin
Synonyms:	Not available
CAS number:	9065-68-3
Ingredients or impurities that contribute to the hazard (%m):	Styrene Monomer 23 a 54% (nº CAS: 100-42-5)

4- FIRST-AID MEASURES

Inhalation:	No risks concerning inhalation at room temperature. Remove the victim to fresh air. Monitor respiratory function. If there is breathing difficulty, provide oxygen. If necessary, give artificial respiration. Seek medical attention. Take this SDS.
Ingestion:	Rinse the victim's mouth with water. Provide plenty of water for the victim to drink if it is conscious. Seek medical attention. Take this SDS.
Skin contact:	Remove contaminated clothing and shoes. Wash affected area with water and soap. Wash contaminated clothing and shoes before reuse. Seek medical attention. Take this SDS.
Eye contact:	Wash eyes immediately with running water, keeping the eyelids open. Remove contact lenses if present and easily removable. Seek medical attention. Take this SDS.
Most important symptoms and effects, both acute and delayed:	Redness and pain in the skin. Redness, pain, and watery eyes. Cough, sore throat, difficulty breathing, nausea, abdominal pain and diarrhea. Fatigue, muscle weakness, feeling of drunkenness, dizziness, drowsiness, headaches and incoordination. Difficulty concentrating and remembering. It can affect balance, the ability to learn and time of reflection.
Lifeguard protection and /or notes for the doctor:	Avoid contact with the product while helping the victim. Keep victim heated and at rest. Symptomatic treatment should include, above all, supportive measures such as correction of electrolyte, metabolic and respiratory abnormalities.

5- FIREFIGHTING MEASURES

Fire Extinguishing Media:	Flammable product. Compatible with any means of extinction as dry chemical, alcohol resistant foam and water mist.
Special hazards arising from the substance or mixture:	When in a fire, may produce irritating and toxic gases like carbon monoxide and dioxide.
Advice for firefighters:	Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.
Special hazards from the combustion of the chemical:	In combustion, can form toxic and irritants gases such as carbon monoxide and carbon dioxide. Releases gases and /or fumes when heated and they might be respiratory sensitizers.

6- ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	
Removal of ignition sources:	Flammable product. Eliminate preventively all the ignition sources around the area. Do not smoke in the area.
Provision of enough ventilation:	Use in a well ventilated area or with exhaustion system adequate to eliminate mists and vapors.
Prevention of inhalation and skin, mucous membranes and eyes contact:	Do not touch damage containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation, eye and skin contact. Use appropriate personal protective equipment as indicated in Section 8.
Environmental precautions:	Do not let this chemical enter the environment (soil, waterways and groundwater).
Methods and material for containment and cleaning up:	Use water fog or vapor suppressing foam to reduce the spread of fumes. Use physical barriers or containment of spills. Collect spilled material and place into containers. Adsorb the remaining product with sand, earth, vermiculite or other inert material. Place absorbed material in appropriate containers and remove to safe place.

7- HANDLING AND STORAGE

Precautions for safe handling:	Avoid contact with skin, eyes and clothing. Avoid breathing the product. Remove ignition sources and heat. Use proper personal protective equipment as indicated in Section 8.

Hygiene advice:	Do not eat, drink or smoke when using this product. Wash hands before eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.
Packaging materials:	Metals should not be used.

8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Specific control parameters

Occupational exposure limit:

Ingredients	**TLV – TWA/ STEL** (ACGIH) (2010)	**REL – TWA / STEL** (NIOSH)	**PEL - TWA / C** (OSHA)
	(ppm)	**(ppm)**	**(ppm)**
Styrene Monomer	20 / 40	50 / 100	100 / 200

Biological indicators:	BEI: mandelic acid + fenilglioxilic acid in urine - 400 mg / g creatinine (ACGIH). BEI: Styrene in venous blood - 0.2 mg / L (ACGIH).
Appropriate engineering controls:	Provide mechanical ventilation or direct exhaustion to the external media. It is recommended safety shower and eye bath available near working area. The engineering controls measures are the most effective to reduce exposure to the product.
Individual protection measures, such as personal protective equipment	
Eye/face protection:	Splash goggles.
Skin and hand protection:	Protective gloves of polyvinyl alcohol (PVA) or a polymer film.
Respiratory protection:	Respiratory protection with filter against fumes/ mist. In case of exposure to high concentrations an air-supplied respirator should be used, full face operating in positive pressure mode can also be used on any type of respirator (SCBA).
Thermal hazard:	Complete air-ventilated suit, with air supply, or any thermo-resistant clothing available.
Environmental exposure controls:	Do not dump directly into the environment or into the sewer system. The dilution water from fire fighting can cause pollution.

9- PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Oily liquid colorless to yellow.
Odor:	Characteristic of styrene.
Odor threshold:	Not available.
pH:	Not available.
Melting point/freezing point:	Not available.
Initial boiling point and boiling range	145°C
Flashpoint:	31°C (closed cup- styrene monomer)
Evaporation Rate	12,4
Flammability:	Flammable.
Upper/lower flammability or explosive limits:	Lower: 1,1%. Upper: 7%
Vapour density (Air=1):	3,6 (Air=1)
Vapour Pressure (mm Hg):	4,3
Relative density:	1,05 at 1,20g/cm^3
Solubility in water:	Insoluble.
Solubility in other solvents:	Partially soluble in acetone and styrene.
Partition coefficient: n-octanol/water:	Log kow = 3,6
Auto-ignition temperature:	490°C
Decomposition temperature:	Not available.
Viscosity:	Not available.

10- STABILITY AND REACTIVITY

Chemical stability:	Stable under normal handling and storage. The product may undergo polymerization when heated in light, oxygen, peroxides and oxidizers and can cause fires and explosions.
Possibility of hazardous reactions:	Reacts violently with acids and strong oxidants causing fire and explosion.

Incompatible materials:	Oxidizing agents, strong acids, peroxides and metals.
Conditions to avoid:	High temperatures, ignition sources and contact with incompatible materials.
Hazardous decomposition products:	When heated, may release toxic and irritating vapors such as carbon monoxide and carbon dioxide.

11- TOXICOLOGICAL INFORMATION

Acute toxicity:	May be harmful if swallowed causing gastrointestinal disturbances with nausea, vomiting, abdominal pain and diarrhea. It can be harmful if inhaled causing respiratory tract irritation with cough and sore throat. LD_{50} (oral, rats) 5000mg/kg ETAm(oral)= 4629 mg/kg LC_{50} (inhalation, rats) 11,7 mg/L ETAm (inhalation) = 20,3 mg/L
Skin corrosion/irritation:	Skin irritation with redness and itching.
Serious eye damage/irritation:	Causes serious eye irritation with redness, tearing eyes, pain, irritation of the iris, redness of the conjunctiva or corneal opacity.
Respiratory or skin sensitization:	Can cause skin and airways sensitization.
Germ cell mutagenicity:	Mutagenic in tests with human cells. Studies of occupational exposure to styrene link to DNA adduct formation and sister chromatid exchange.
Carcinogenicity:	ACGIH – A4 – Not classifiable as a human carcinogen Possibly carcinogenic to humans (Group 2B - IARC)
Reproductive toxicity:	May impair fertility and / or fetus
STOT – single exposure:	May cause central and peripheral nervous system effects with dizziness, feeling of drunkenness, drowsiness, headache, incoordination, fatigue, muscular weakness. May cause respiratory tract irritation with cough, sore throat and burning sensation.
STOT – repeated exposure:	May cause dryness after repeated and prolonged contact with skin. May cause nervous system effects with difficulty concentrating, can affect the memory, equilibrium, learning capacity and reflex time. It

	can affect liver function, renal and hematopoietic.
Aspiration hazard.	It can cause chemical pneumonitis if aspirated with cough and shortness of breath

12- ECOLOGICAL INFORMATION

Ecological toxicity:	There aren't known ecological toxicity values.
Persistence and degradability:	It's expected low persistence and high degradability.
Bioaccumulative potential:	Presents a low potential for bioaccumulation in aquatic organisms. Log Kow: 3,6 BCF: 13,5
Mobility in soil:	It is expected low mobility in soil.
Results of PBT and vPvB assessment:	Not available.

13- DISPOSAL CONSIDERATION

Product:	The treatment and disposal should be evaluated specifically for each product. Can be deposited in landfills, sent to an appropriate incineration or other means of disposal provided they meet the requirements of local law.
Product waste:	Keep the product remains in their original containers and properly sealed. Disposal should be performed as established for the product.
Contaminated packaging:	Polyethylene package must be submitted to re-utilization in the working environment. Package may be reused or recycled by specialized companies.

14- INFORMACIÓN DE TRANSPORTE

Regulamentações nacionais e internacionais	
Land (Road/rail):	UN – "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 16th Edition, 2009.
UN number:	1866

Proper shipping name:	RESIN, SOLUTION
Class or division:	3
Packing group:	III
Waterways (sea/inland):	IMO - "International Maritime Organization" International Maritime Dangerous Goods Code (IMDG Code) - Incorporating Amendment 34-08; 2008 Edition
UN number:	1866
Proper shipping name:	RESIN, SOLUTION
Class or division:	3
Subsidiary risk:	-
Packing group:	III
Marine pollutant:	No
EmS:	F-E, S-E
Air:	IATA - "International Air Transport Association" Dangerous Goods Regulation (DGR) - 52th Edition, 2011.
UN number:	1866
Proper shipping name:	RESIN, SOLUTION
Class or division:	3
Subsidiary risk:	-
Packing group:	III

15- REGULATORY INFORMATION

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Regulation 1272:2008: GHS, United Nations, 3th Revised Edition, 2009

ECB: Directives 67/548 e 1999/45

UN Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 16th Edition, 2009

Restrictions: No use restrictions were found.

16- OTHER INFORMATION

Elekeiroz warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is responsibility of the product user enterprise to promote the training of its employees and contractors about the possible risks arising from the product.

SDS elaborated by InterTox: January, 2011 – http://www.intertox.com.br

Abbreviations:

ACGIH – American Conference of Industrial Hygienists
CAS – Chemical Abstracts Service
IARC – International Agency for Research on Cancer
LD_{50} – Lethal Dose 50%
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average
UN – United Nations

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